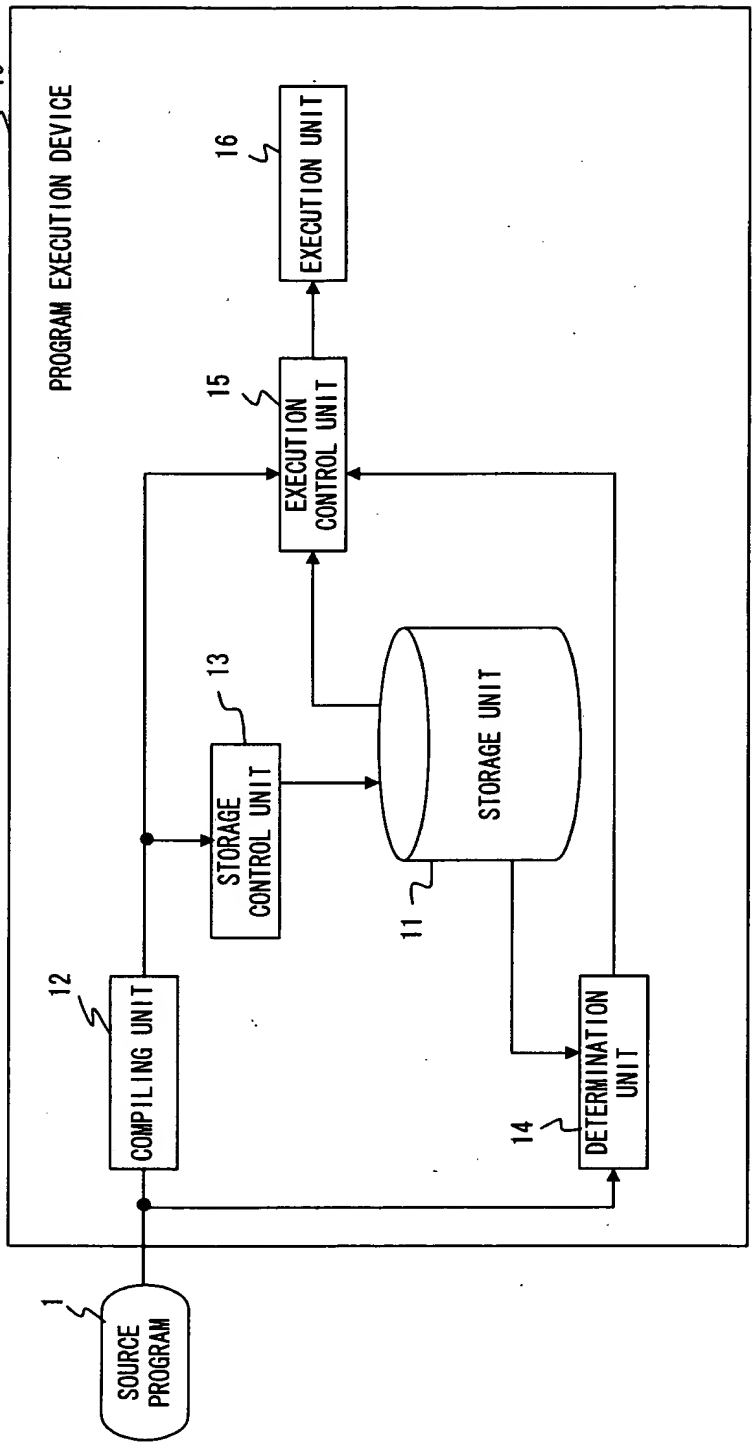
10
PROGRAM EXECUTION DEVICE
16
EXECUTION UNIT
15
EXECUTION CONTROL UNIT
13
STORAGE CONTROL UNIT
STORAGE UNIT
11
12
COMPILING UNIT
14
DETERMINATION UNIT
1
SOURCE PROGRAM

FIG. 1

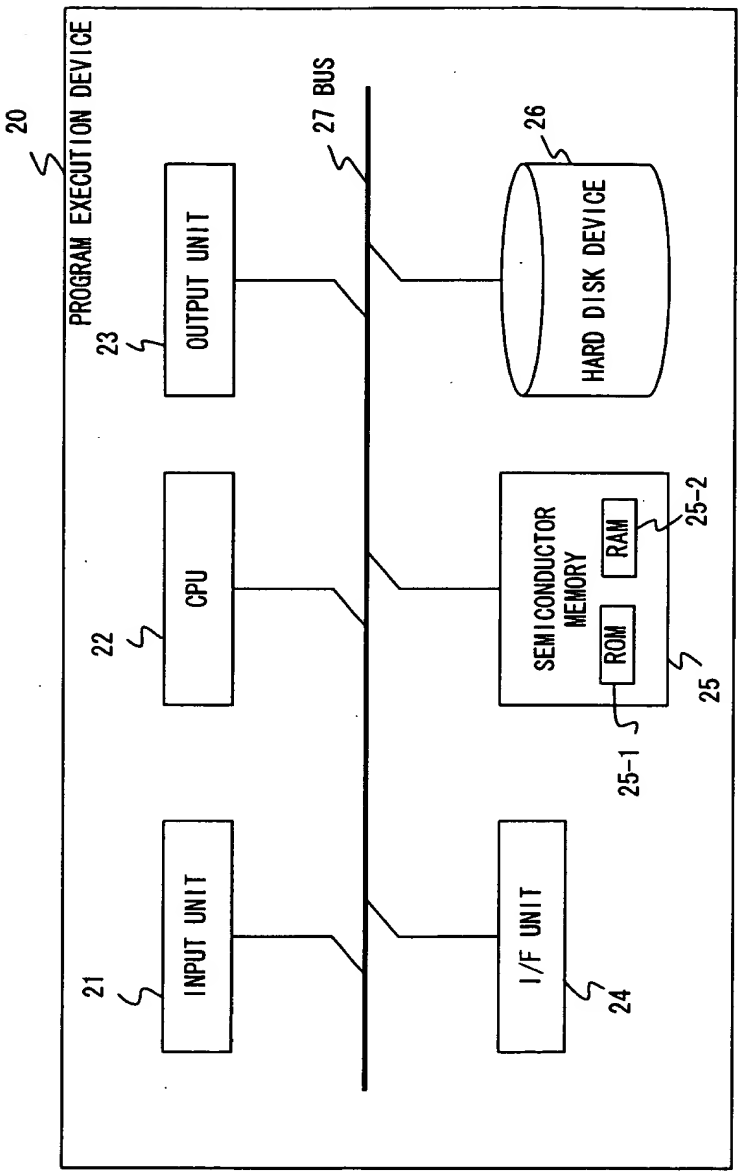
20
PROGRAM EXECUTION DEVICE
27 BUS
26
HARD DISK DEVICE
23
OUTPUT UNIT
22
CPU
SEMICONDUCTOR MEMORY
RAM
ROM
25-2
25
25-1
21
INPUT UNIT
I/F UNIT
24

FIG. 2

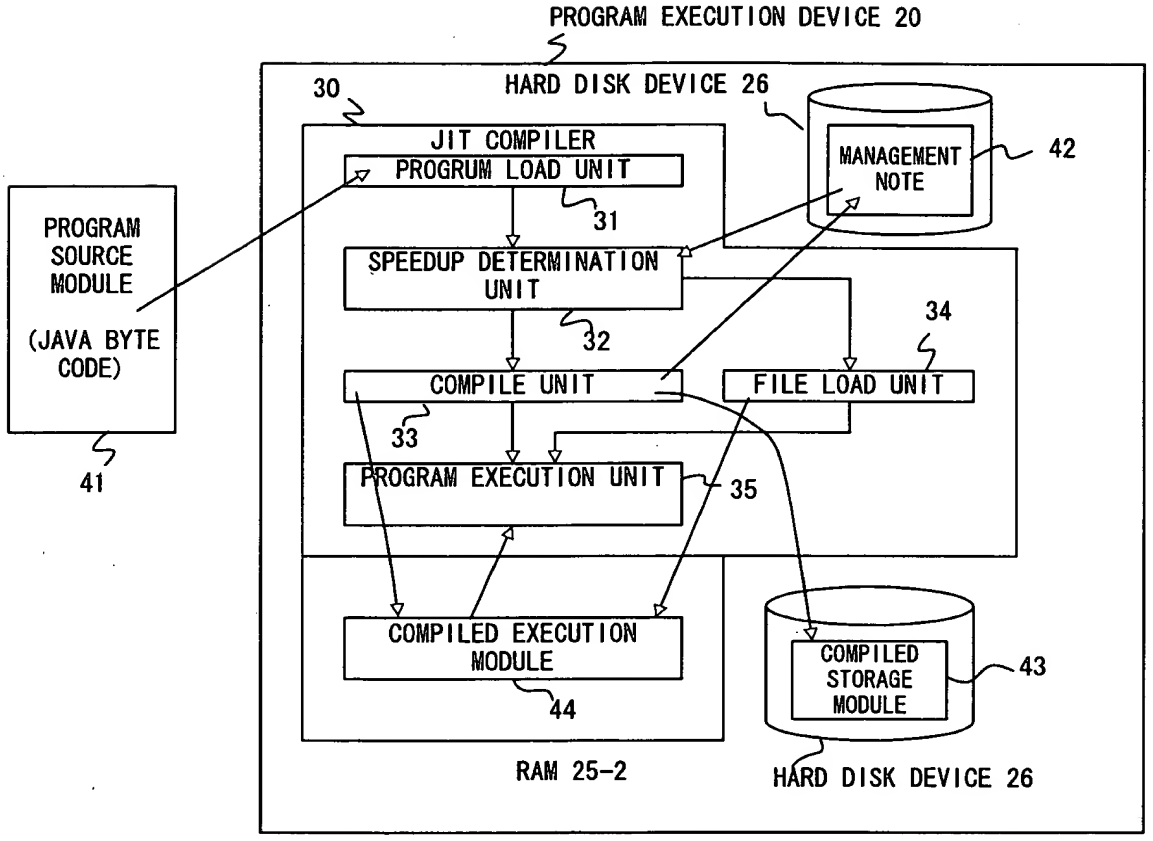
PROGRAM EXECUTION DEVICE 20
30
HARD DISK DEVICE 26
JIT COMPILER
PROGRUM LOAD UNIT
31
MANAGEMENT NOTE
42
PROGRAM SOURCE MODULE
(JAVA BYTE CODE)
41
SPEEDUP DETERMINATION UNIT
32
34
COMPILE UNIT
FILE LOAD UNIT
33
PROGRAM EXECUTION UNIT
35
COMPILED EXECUTION MODULE
44
COMPILED STORAGE MODULE
43
RAM 25-2
HARD DISK DEVICE 26

FIG. 3

METHOD NAME (TO BE COMPILED)	PROGRAM SOURCE MODULE UPDATE DATE AND TIME
open	1999.09.10 : 13.25.00
read	2000.01.11 : 09.57.34
write	2000.01.11 : 09.57.34
close	1999.09.10 : 13.25.00

FIG. 4

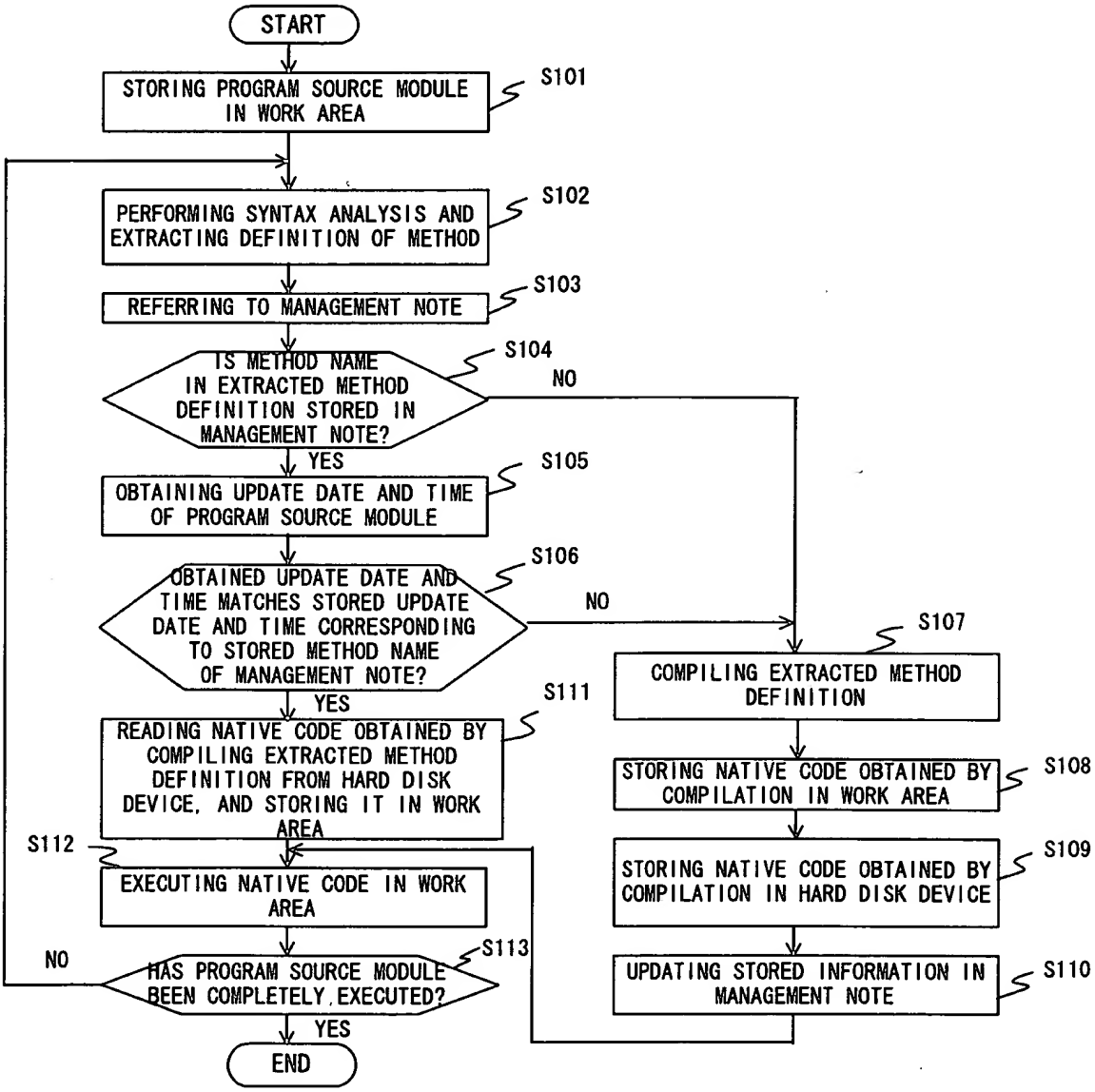
START
STORING PROGRAM SOURCE MODULE IN WORK AREA
S101
PERFORMING SYNTAX ANALYSIS AND EXTRACTING DEFINITION OF METHOD
S102
REFERRING TO MANAGEMENT NOTE
S103
IS METHOD NAME IN EXTRACTED METHOD DEFINITION STORED IN MANAGEMENT NOTE?
S104
NO
YES
OBTAINING UPDATE DATE AND TIME OF PROGRAM SOURCE MODULE
S105
OBTAINED UPDATE DATE AND TIME MATCHES STORED UPDATE DATE AND TIME CORRESPONDING TO STORED METHOD NAME OF MANAGEMENT NOTE?
S106
NO
YES
COMPILING EXTRACTED METHOD DEFINITION
S107
READING NATIVE CODE OBTAINED BY COMPILING EXTRACTED METHOD DEFINITION FROM HARD DISK DEVICE, AND STORING IT IN WORK AREA
S111
STORING NATIVE CODE OBTAINED BY COMPILATION IN WORK AREA
S108
STORING NATIVE CODE OBTAINED BY COMPILATION IN HARD DISK DEVICE
S109
UPDATING STORED INFORMATION IN MANAGEMENT NOTE
S110
S112
EXECUTING NATIVE CODE IN WORK AREA
NO
HAS PROGRAM SOURCE MODULE BEEN COMPLETELY EXECUTED?
S113
YES
END

FIG. 5

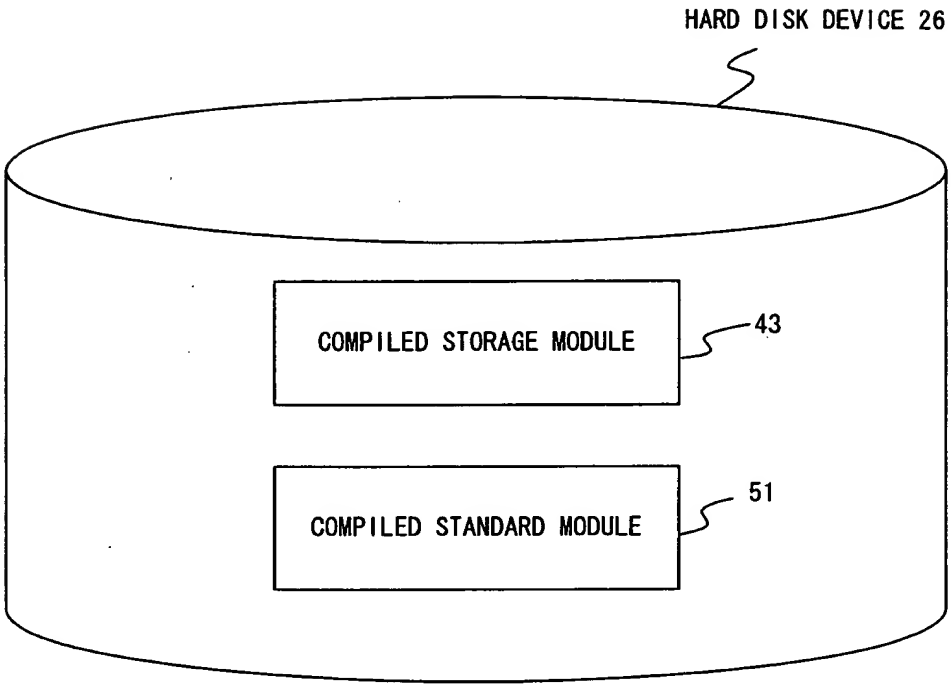
HARD DISK DEVICE 26
COMPILED STORAGE MODULE
43
COMPILED STANDARD MODULE
51

FIG. 6

METHOD NAME	PROGRAM SOURCE MODULE UPDATE DATE AND TIME
function 1	1999. 09. 10 : 13. 25. 00
function 2	2000. 01. 11 : 09. 57. 34
function 3	1999. 09. 10 : 13. 25. 00
standard 1	
standard 2	
standard 3	

MANAGEMENT INFORMATION ABOUT COMPILED STORAGE MODULE

MANAGEMENT INFORAMTION ABOUT COMPILED STANDARD MODULE

FIG. 7

APPARATUS AND METHOD FOR EXECUTING PROGRAM...
Akira Tsuboi
Greer, Burns & Crain, Ltd. (Patrick Burns)
Ref. No. 1503.64973
Sheet 7 of 12
(312) 360 00

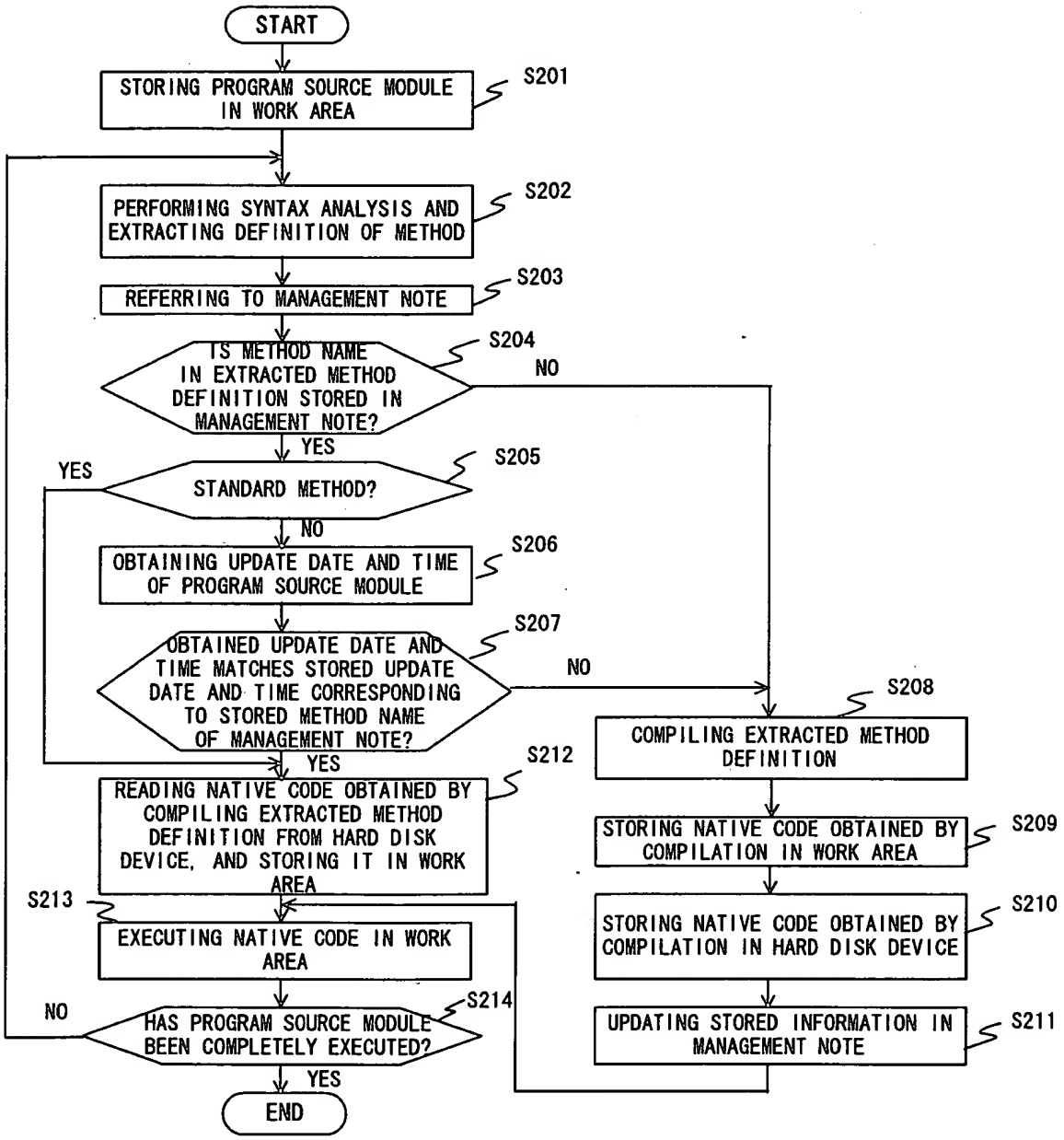
START
STORING PROGRAM SOURCE MODULE IN WORK AREA
S201
PERFORMING SYNTAX ANALYSIS AND EXTRACTING DEFINITION OF METHOD
S202
REFERRING TO MANAGEMENT NOTE
S203
IS METHOD NAME IN EXTRACTED METHOD DEFINITION STORED IN MANAGEMENT NOTE?
S204
NO
YES
STANDARD METHOD?
S205
YES
NO
OBTAINING UPDATE DATE AND TIME OF PROGRAM SOURCE MODULE
S206
OBTAINED UPDATE DATE AND TIME MATCHES STORED UPDATE DATE AND TIME CORRESPONDING TO STORED METHOD NAME OF MANAGEMENT NOTE?
S207
NO
YES
COMPILING EXTRACTED METHOD DEFINITION
S208
READING NATIVE CODE OBTAINED BY COMPILING EXTRACTED METHOD DEFINITION FROM HARD DISK DEVICE, AND STORING IT IN WORK AREA
S212
STORING NATIVE CODE OBTAINED BY COMPILATION IN WORK AREA
S209
S213
EXECUTING NATIVE CODE IN WORK AREA
STORING NATIVE CODE OBTAINED BY COMPILATION IN HARD DISK DEVICE
S210
NO
HAS PROGRAM SOURCE MODULE BEEN COMPLETELY EXECUTED?
S214
UPDATING STORED INFORMATION IN MANAGEMENT NOTE
S211
YES
END

FIG. 8

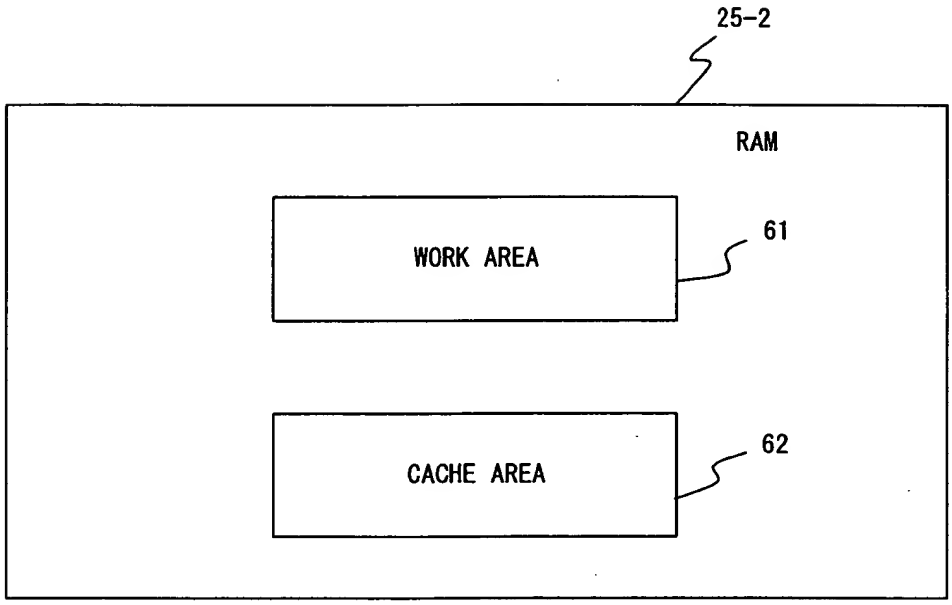

FIG. 9

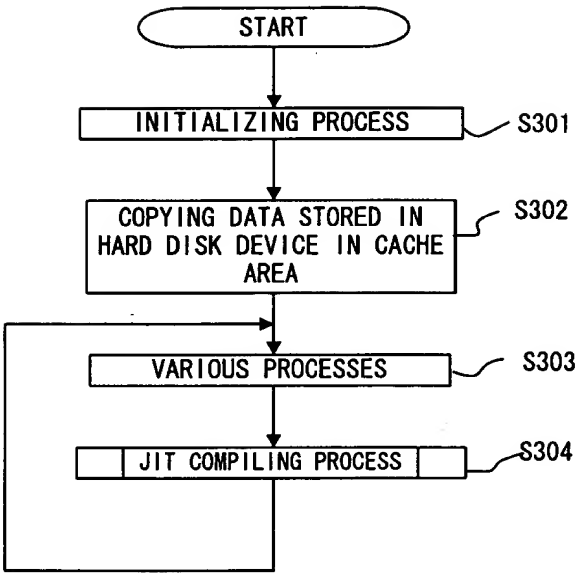
START
INITIALIZING PROCESS
S301
COPYING DATA STORED IN HARD DISK DEVICE IN CACHE AREA
S302
VARIOUS PROCESSES
S303
JIT COMPILING PROCESS
S304

FIG. 10

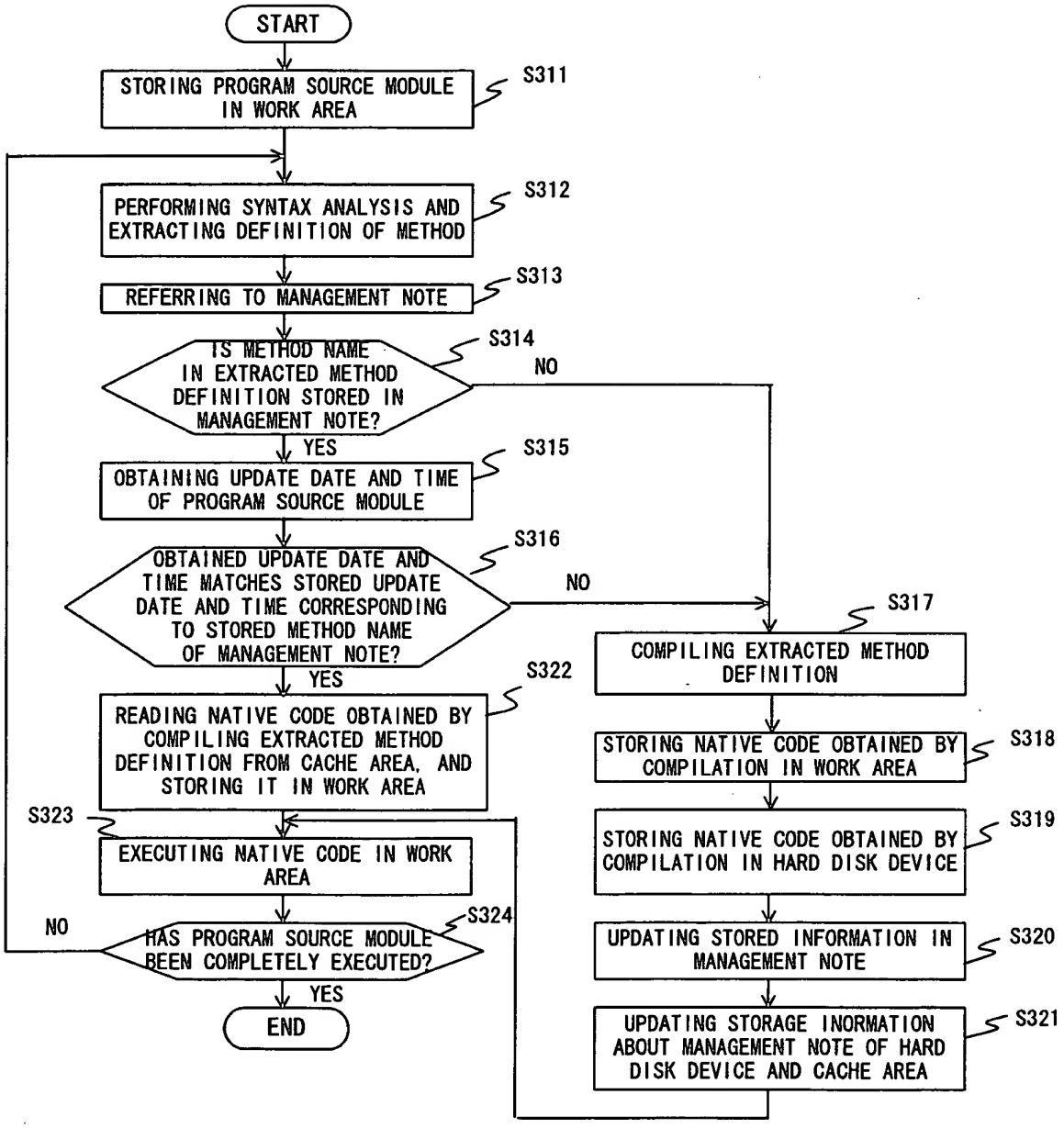
START
STORING PROGRAM SOURCE MODULE IN WORK AREA
S311
PERFORMING SYNTAX ANALYSIS AND EXTRACTING DEFINITION OF METHOD
S312
REFERRING TO MANAGEMENT NOTE
S313
IS METHOD NAME IN EXTRACTED METHOD DEFINITION STORED IN MANAGEMENT NOTE?
S314
NO
YES
OBTAINING UPDATE DATE AND TIME OF PROGRAM SOURCE MODULE
S315
OBTAINED UPDATE DATE AND TIME MATCHES STORED UPDATE DATE AND TIME CORRESPONDING TO STORED METHOD NAME OF MANAGEMENT NOTE?
S316
NO
YES
COMPILING EXTRACTED METHOD DEFINITION
S317
READING NATIVE CODE OBTAINED BY COMPILING EXTRACTED METHOD DEFINITION FROM CACHE AREA, AND STORING IT IN WORK AREA
S322
STORING NATIVE CODE OBTAINED BY COMPILATION IN WORK AREA
S318
STORING NATIVE CODE OBTAINED BY COMPILATION IN HARD DISK DEVICE
S319
UPDATING STORED INFORMATION IN MANAGEMENT NOTE
S320
UPDATING STORAGE INORMATION ABOUT MANAGEMENT NOTE OF HARD DISK DEVICE AND CACHE AREA
S321
S323
EXECUTING NATIVE CODE IN WORK AREA
NO
HAS PROGRAM SOURCE MODULE BEEN COMPLETELY EXECUTED?
S324
YES
END

FIG. 11

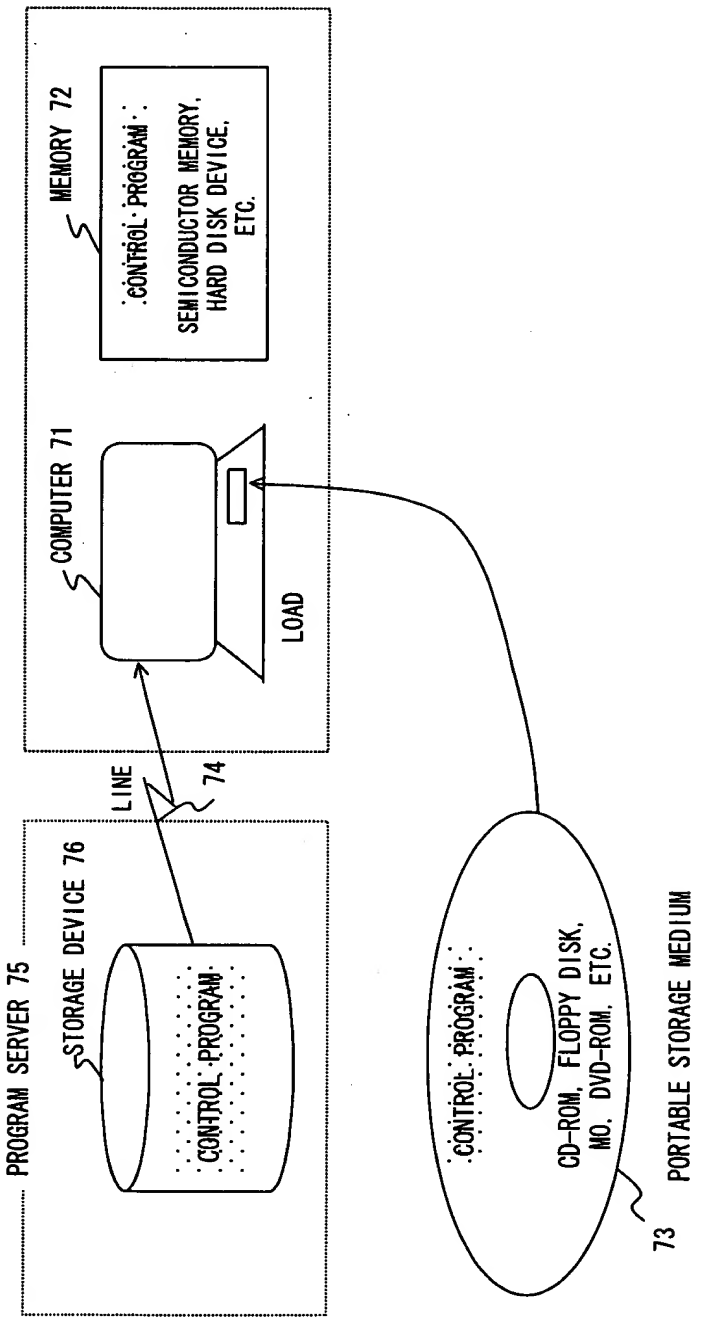
MEMORY 72
CONTROL PROGRAM
SEMICONDUCTOR MEMORY, HARD DISK DEVICE, ETC.
COMPUTER 71
LOAD
LINE
74
PROGRAM SERVER 75
STORAGE DEVICE 76
CONTROL PROGRAM
CONTROL PROGRAM
CD-ROM, FLOPPY DISK, MO, DVD-ROM, ETC.
73
PORTABLE STORAGE MEDIUM

FIG. 12